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AUTHOR Starn, Jane Ryburn; Paperny, David M.
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ABSTRACT

Teenage pregnancy has become a major public health problem in the United States. A study was conducted to assess an intervention based upon computer-assisted instruction (CAI) to avert teenage pregnancy. Social learning and decision theory were applied to mediate the adolescent environment through CAI so that adolescent development would be enhanced, fostering mature decision making. A non-random comparative design was implemented in five high schools on the island of Oahu. High school students (N=718) served as either control subjects or as experimental subjects who played one of two computer games, either Baby Game or Romance. Experimental subjects rated the games favorably. Compared to controls, significantly more of the Baby Game players could identify the time required for child care, and the costs for childbirth, care for the first year of life, and raising a child to age 18. Compared to controls, significantly more of the Romance players reported they would ask a health professional for birth control advice, find it easy to get and use birth control, and identify effective and noneffective methods of birth control. Informal follow-up interviews revealed that pregnancy rates were lower in two settings where the games had been implemented for over one year. These preliminary findings suggest that CAI may be a viable intervention to avert teenage pregnancy. Further research is being planned. (NB)

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COMPUTER-ASSISTED INSTRUCTION TO AVERT TEEN PREGNANCY

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JANE RYBURN STARN, R.N., DR.P.H.
DAVID M. PAPERNY, M.D.
UNIVERSITY OF HAWAII

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Teen pregnancy has become a major public health problem in the United States, costing billions yearly in health and welfare expenditures and severely limiting the potential of teens and their babies. This research explores an intervention based upon computer-assisted instruction (CAI) designed to avert teen pregnancy.

Two computer game programs, entitled the Baby Game and Romance, were developed by David M. Paperny, M.D., Chief, Adolescent Medicine, Kaiser Permanente Medical Center, Honolulu, with consultation by several professionals including this author. The games were designed to foster teen decision making in the areas of sexuality, contraception, pregnancy, and parenting. This study describes the games' development and a preliminary evaluation of efficacy. The theoretical framework upon which the research is based applied social learning and decision theory to mediate the teen environment through (CAI) so that adolescent development would be enhanced, fostering mature teen sexual and reproductive decision making.

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The research question upon which this dissertation was based sought to determine whether CAI could be utilized effectively to decrease teen pregnancy. The research hypotheses were: 1) teens who play the Baby Game or Romance readily accept and positively evaluate the games, 2) the Baby Game or Romance interventions increase teen knowledge and attitudes favoring responsible sexual decision making, and 3) lower levels of teen pregnancy occur in settings where this CAI intervention is utilized.

A non-random comparative design was implemented in five high schools on the island of O'ahu. Instruments based upon the content of each game were developed to assess the subjective and objective impact of the interventions. Data were obtained from 718 students, ages 13-18, from Kaiser, Kalani, Kamehameha, Punahou, and Waianae High Schools--representing both the private and public sector schools. Slightly more females than males, and mostly Caucasians, Hawaiian/part-Hawaiian, and Oriental students played the games. Filipino students were under-represented in the study. This research used descriptive, cross tabulation, and contingency table analysis due to the nominal/interval nature of the dat The data were analyzed separately for each game.

Subjective analysis by the Baby Game experimental subjects included a 3.9 out of 5 (high) rating of the game

with 66% of the experimental students saying they would play the game again and 78.6% wanting to recommend the game to a friend. (See Table 1) Some of the students wrote statements in the allotted spaces about the Baby Game which furether support an impact of the game upon the students. A Kalani teen wrote, "It gave me an idea of how hard it is to bring up a child these days." A Kamehameha teenager seemed to have a similar reaction when she wrote, "It showed me I wasn't ready to be a parent yet....At first, I wanted to have a baby, but after playing the game, I don't think I'm ready." Two Punahou teenagers also made statements suggestive of the game's impact. One wrote, "It makes you see the amount that your life would change." The other said, "It makes you realize how much you would have to think about and be responsible for if you had a kid." Two Waianae High School teenagers also made significant statements. "It made me learn things about being a parent that I didn't know." The other worte, "The best thing about this game is that it really makes you realize how hard it would be to raise a child at my age." A Kaiser High School adolescent stated, "I think this game is great and schould be used in all the schools."

The Romance evaluations were more favorable with a 4.4 game rating achieved, and 69.6% of the students stating they would like to play the game again and 86.6% wanting to

recommend the game to a friend. (See Table 2). There were quotes by student participants from each of the sample high schools which suggest that Romance made an impact upon these students. A Kalani High School teen said, "The game tells us how easily one can get pregnant." A Kaiser High School adolescent stated, "It teaches good planning for a teenager, and I could do it in privacy." A Kamehameha High School teenager wrote that the game..."Let me try life and sex without the real consequences. It made me think and gave me the answers after mistakes." Another said, "It was like a review and counseling session." Four Punahou students made insightful comments after playing Romance. One wrote, "I think it's great and I'd love to play it again. It taught me a lot and made me realize that hope isn't a good method!" Another said, "The Dating Game made me see how riskly some birth control is." The third student indicated that..."it wasn't embarassing using the computer. It was better than if I had to talk to a teacher about it." Finally, a Punahou student wrote,..."Getting pregnant was so realistic it scared me." Several Waianae High School teenagers also made comments about the game. One wrote that..."It helps you make decisions on whether to have sex or not." Another said, "It made me realize how important it is to use protection." Another said simply that he had learned to..."not get a girl pregnant." Another student indicated that the worst thing

about the game for her was..."getting pregnant by choosing a method I thought was safe." Finally, a Waianae High School student said that Romance...."makes a person think more responsibly about getting sexually involved."

Comparing the effect of the Baby Game intervention revealed that significantly more of the experimental subjects compared to the controls could identify the time required for child care, and the costs for child birth, care for the first year of life, and raising a child to 18. (See Table 3). Analysis of Romance revealed that significantly more of the experimentals when compared to the controls would ask a health professional for birth control advice, find it easy to get and use birth control, and identify effective and non-effective methods of birth control. These students could also state that pregnancy could result from having sex once, that birth control pills are a good method for teens, and that birth control is worth the money for teens. (See Table 4). Controlling for the demographic variables of age, sex, ethnicity, and school did not reveal any significant trends. Informal follow-up interviews revealed that pregnancy rates are lower in two settings where the games have been implemented for over one year. Thus, study hypotheses were upheld.

However, the Baby Game and Romance findings are preliminary and cannot be transferred to the general population. This study does suggest that CAI may be a viable intervention to avert teen pregnancy. The games are low in cost and readily implemented in a variety of settings. Replication and formal follow-up research is required to substantiate these exploratory findings. Such a study is currently being planned.

Table I

Baby Game Evaluation by

Experimental Group and by School

School N = 177	Mean rating of game 1(low) to 5(high)	Who would play game again		Who would recommend game to friend	
		N	%	N	%
N					
Kalani (33)	3.9	24	74	25	77
Kaiser (24)	3.3	12	48	16	67
Kamehameha (40)	3.7	26	65	30	76
Punahou (39)	4.1	19	48	30	76
Waianae (41)	4.6	39	95	40	97
Total mean	3.9	120	66%	141	78.6

Table 2

Romance Game Evanuation

by Experimental Group by School

School N=192	Mean rating of game 1(low) 5(high)	Who would play game again		Who would recommend game to friend	
N		N	%	N	%
Kalani (36)	4.1	19	53	29	81
Kaiser (50)	4.2	31	61	40	79
Kamehameha (19)	4.2	14	73	15	80
Punahou (31)	4.8	22	72	29	93
Waianae (56)	4.5	50	89	56	100
Total mean	4.4	136	69.6	169	86.6

Table 3

Baby Game Summary: Post Test Variables

by Objective and Significant Decrease in Treatment Group

Question	Significant increase in treatment group
Objective 1: Knowledge about the time required to care for a baby:	
Do you think a baby would take up a lot of the time you now spend in school and/or on the job?	no
How many hours a day do you think are required to take care of a baby?	yes
Objective 2: Knowledge about the money required to raise a child:	
Do you think you would have enough money to raise a baby now?	no
How much do you think it costs to give birth to a baby?	yes
How much do you think child care for the first year of life costs?	yes
How much do you think it costs to raise a child to age 18?	yes
Objective 3: Attitude valuing delaying parenthood	
Would you like to have a baby of your own now?	no
Do you think you (and your partner if you have one) would make a good parent now?	
Would having a baby bring more happiness or problems to your life?	no
Objective 4: Attitude valuing the use of birth control	
Do you think it's a good idea to avoid pregnancy by using birth control?	no

Table 4

Romance Summary: Post-Test Variables

by Objective and Significant Increase in Treatment Group

Question	Significant increase in treatment group
Objective 5: Attitude valuing the use of contraception	
If you wanted advice or information about sex or birth control, who would you ask?	yes
If a couple had sex just once without birth control, what would be the chances of pregnancy?	yes
If needed, how easy would it be for you to get and use a good method of birth control?	yes
Is using birth control worth the money?	yes
Objective 6: Knowledge about the use and effectiveness of contraception	
Are birth control pills a good method of birth control for teenagers to use?	yes
What is the most effective method of birth control for preventing pregnancy?	yes
What is another very good method of birth control to prevent pregnancy?	yes
What is the type of birth control least effective in preventing pregnancy	yes
What is another type of birth control that is not good in preventing pregnancy?	yes
Object 7: Insert control question, not included in program	
At what time in a girl's menstrual cycle would sexual intercourse probably cause pregnancy?	no